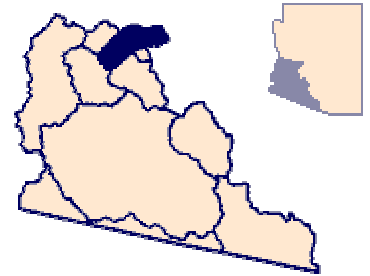


MCMULLEN VALLEY GROUNDWATER BASIN

McMullen Valley groundwater basin is located in the western part of Arizona and contains 591 square miles (Figure 15). The McMullen Valley is approximately 48 miles long and 15 miles wide and is bounded by the Harcuvar Mountains to the north, the Harquahala Mountains to the south and the Little Harquahala and Granite Wash Mountains to the west. The Valley is drained by Centennial Wash, an ephemeral stream that discharges from the basin through the "Narrows" into the Harquahala Plains.



Elevations range from 5,720 feet above mean sea level at Harquahala Peak to approximately 2,000 feet above mean sea level on the valley floor. A buried bedrock ridge, near the Narrows at the southeast end of Harrisburg Valley, controls the general elevation of the water table in this area. The land surface gradient is greater than the slope of the water table; thus, the depth to water increases northeastward along the valley floor and laterally from the axis of the valley.

The aquifer in the McMullen Valley basin is comprised of basin-fill that contains clay, silt, sand, and gravel. The basin-fill consists of alluvium, lake-bed deposits, alluvial-fan deposits, and a conglomerate unit (Kam, 1961).

The alluvium is the upper part of the basin-fill and has been deposited by Centennial Wash and its tributaries. It is composed mainly of unconsolidated silt, sand, and gravel. In the central and lower parts of the valley, the alluvium overlies the lake-bed deposits, however, in most places the alluvium overlies the alluvial-fan deposits. This unit ranges in thickness from about 50 feet near the southeastern end of Harrisburg Valley to 470 feet north of Aguila. The alluvium averages 100 feet in the Wenden-Salome area. In all areas, the alluvium thins to a veneer along the margins of the valley floor (Kam, 1961). Many domestic and stock wells in the Aguila area previously obtained water from the alluvium, and irrigation wells obtained water from both the alluvium and the alluvial-fan deposits. In recent years, withdrawals of groundwater for irrigation have dewatered the alluvium (Kam, 1961).

The lake-bed deposits are composed of fine-grained materials that have been deposited in the central and lower parts of the valley. The thickness of these deposits vary from 150 feet three miles southwest of Wenden to about 1,100 feet four miles northeast of Wenden (Kam, 1961). Because of the low permeability of the lake-bed deposits, this unit is not considered to be a potential source of water for irrigation. Additionally, these deposits may impede the downward migration of water, thereby creating a perched aquifer on top of the lake bed deposits (Kam, 1961).

The alluvial-fan deposits composed of clay, silt, sand, and gravel constitute the principal water-bearing unit in McMullen Valley. These deposits underlie most of the valley floor and in the Aguila area overlie the conglomerate. Thickness of the unit varies from 230 feet, in the Wenden-Salome area, to 3,100 feet, about 9 miles north of Aguila (Kam, 1961). Yields from large-diameter irrigation wells tapping this unit range from 150 to 3,500 gallons per minute (Kam, 1961).

The basal water-bearing unit is a conglomerate unit and is present at a depth of about 850 to 1,600 feet below land surface (Kam, 1961). Currently no data are available regarding the thickness of this unit, although 460 feet of this material was penetrated in a well about one mile northwest of Aguila.

Depth to water in the Aguila area varies from 475 feet below land surface in the vicinity of Aguila, to over 625 feet below land surface near the edges of the alluvial plain southeast of Aguila (Remick, 1981). In Harrisburg Valley, the depth to water ranges from 70 feet below land surface in "the Narrows" to 210 feet below land surface about 5 1/2 miles northwest of "the Narrows". In the Wenden-Salome area, the depth to water ranges from 241 feet below land surface south of Salome to 479 feet below land surface northeast of Wenden.

An estimated 15,100,000 acre-feet of groundwater are in storage to a depth of 1,200 feet below land surface (Arizona Department of Water Resources, 1988). Groundwater in the basin is recharged only by rainfall and agricultural return

flow. Groundwater withdrawals by agriculture greatly exceed recharge and cause depletion of the aquifer.

The three major communities in the McMullen Valley are Wenden, Salome, and Aguila. Groundwater-level declines in the area of Wenden and Salome averaged as much as 11.4 feet per year for the period of 1958-1980 (Remick, 1981). Groundwater-level declines in the Aguila area averaged as much as 8 feet per year for the same period of time. Groundwater movement is currently toward two cones of depression in the groundwater system which were formed in the late 1950's (Remick, 1981). One cone is located near Aguila and the other is in the area of Wenden and Salome. These cones of depression are due to total groundwater withdrawals from 1945 to 1988 in excess of 2.3 million acre-feet. Single well declines of between 10 and 250 feet have been noted from 1945 to 1988 and are dependent on proximity to irrigated lands (Arizona Department of Water Resources, 1988).

The groundwater generally is of good quality in the McMullen Valley basin. Total dissolved solids concentrations range from 217 to 522 milligrams per liter (mg/l). Fluoride values range from 0.8 to 22 mg/l, with most samples containing less than 4.0 mg/l.